

REMARKS

Claims 1-21 are pending in the application; the status of the claims is as follows:

Claims 1, 8-11, 18, and 19 are rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,320,560 B1 to Ueno et al ("Ueno").

Claims 2-7, 12-17, and 20-21 are rejected as being unpatentable over Ueno in various combinations with U.S. Patent No. 6,069,603 to Knapp ("Knapp"), U.S. Patent No. 6,252,571 B1 to Nomura et al ("Nomura"), U.S. Patent No. 5,748,277 to Huang et al ("Huang"), or U.S. Patent No. 6,266,113 B1 to Yamazaki et al ("Yamazaki").

Claims 10, 11, 16, and 17 have been amended and new claims 22 and 25 have been added to more particularly point out and distinctly claim the subject matter of the invention. These changes do not introduce any new matter.

35 U.S.C. § 103(a) Rejections

To establish a prima facie case of obviousness, three basic criteria must be met.

First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. MPEP 2142 citing *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

The rejection of claims 1, 8-9, and 18-19 under 35 U.S.C. § 103(a), as being unpatentable over Ueno, is respectfully traversed because Ueno fails to disclose, teach, or otherwise suggest all the limitations of the instant claims. Specifically, Ueno fails to

disclose a controller that is able to use multiple LCD drive methods and that can change which drive method to use.

The use of an LCD with a memory effect is advantageous for battery powered devices because electrical power is not needed to keep an image on the LCD screen once it has been written. However, it typically takes a long time to draw a high contrast image on an LCD having a memory effect, making such LCD's less than ideal for the display of rapidly changing images. The claimed invention minimizes this disadvantage of LCD's having a memory effect by driving the LCD in one of two modes, and changing modes depending on operational considerations. Specifically, one mode of driving the LCD is used for the display of static images and a second mode is used for displaying dynamic images. An e-book reader is described as an exemplary embodiment, wherein the first mode is used to display a page of an e-book for reading, whereas the second mode is used when rapidly "flipping" through the e-book.

This feature of the invention is recited in the claims. For example, both independent claim 1 and independent claim 8 recite, in pertinent part:

a liquid crystal display having a liquid crystal material;
a driver for driving said liquid crystal display; and
a controller for controlling said driver to drive at least a part
of said liquid crystal display by *selectively using one of either a first
drive method and a second drive method* which are different from
each other in operational principle of said liquid crystal material."
(Emphasis Added.)

It is respectfully submitted that Ueno fails to teach or suggest this feature of the invention. The reference describes three previously known methods of driving an LCD (column 3, lines 9-35). However, the reference does not suggest providing a single LCD driver capable of using multiple driving methods and selectively using one of the available LCD driving methods. Accordingly, it is respectfully requested that the rejection of claims 1, 8-9, and 18-19 as being unpatentable over Ueno, be reconsidered and withdrawn.

One known method of writing to an LCD display is to apply appropriate voltages to the column electrodes while scanning the row electrodes. In memory type LCD's, the voltage must be applied to a pixel for a relatively long period of time to fully change a state of the liquid crystal pixel. This makes the display of rapidly changing images problematic. To overcome this difficulty, the present invention writes the pixels at a rate that is too fast for the pixels to completely change state. That is, the pixels only partially change state. This forms an image on the LCD, albeit at reduced contrast. To improve the contrast, the image is overwritten multiple times without erasing the LCD screen in-between. To provide improved responsiveness, the image data is rewritten only if the image data has not changed. After image data is written to the LCD, it is determined whether the image data has changed. If the image data has changed, then the LCD is erased and the writing process repeated. If the image data has not changed, then the image is overwritten to improve image contrast. The steps of checking for changed image data and rewriting the image to the screen are repeated until a desired contrast level is attained.

This feature of the invention is reflected in the claims. For example, claim 10 recites:

a liquid crystal display which is capable of keeping an image,
having been formed thereon, without consuming electric power;
a driver for driving said liquid crystal display; and
a controller for controlling said driver *to write said image to
said liquid crystal display a plurality of times to form at least one
image* in at least one portion of said liquid crystal display.
(Emphasis Added.)

Claim 10, therefore, requires an image to be written to the LCD multiple times to form the final image. It is respectfully submitted that this feature of the claim is not disclosed, taught, or otherwise suggested by Ueno, or any of the other references of record. Accordingly, the rejections of claim 10, and claim 11 which depends therefrom, should be reconsidered and withdrawn.

With respect to the rejection of dependent claims 2-7 and 12-14 over the combination of Ueno and Huang, it is respectfully submitted that Huang does not cure the deficiencies of Ueno. That is, Huang does not disclose, teach, or suggest a device wherein the LCD drive electronics may selectively use one of two methods to drive the LCD. Accordingly, it is respectfully requested that the rejection of these claims be reconsidered and withdrawn.

With respect to claims 15-17, it is respectfully submitted that the proposed combination of Ueno, Huang, and Knapp fails to teach or suggest all of the elements of the claims. Specifically, none of the cited references suggests writing an image to an LCD screen multiple times per frame. Claim 15 requires that the image data be written to the LCD multiple times without resetting the screen between each write. Whereas, in claim 17 the data is written multiple times and then writing stops while the memory effect of the LCD maintains the displayed image. The references are void of any such teaching. Accordingly, it is respectfully requested that the rejection of claims 15-17 be reconsidered and withdrawn.

Regarding the rejections of claims 20 and 21 as being unpatentable over Ueno in view of Nomura and Yamazaki, respectively, it is respectfully submitted that Nomura and Yamazaki fail to provide the necessary teachings missing from Ueno as discussed above. Accordingly, it is respectfully requested that the rejection of claims 20 and 21 be reconsidered and withdrawn.

New Claims

New claims 22-25 have been added to more particularly point out the subject matter of the invention. Specifically, these claims recite that redrawing an image to the screen to improve image contrast is limited to a predetermined maximum number of repetitions and that the image is not redrawn if the image data has changed. New claims 22 and 23 find support in the specification, see for example Figure 13 and the

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corresponding description beginning at page 31, line 19. Claims 24 and 25 find support, for example, beginning at page 28, line 23. No new matter is added.

CONCLUSION

Wherefore, in view of the foregoing amendments and remarks, this application is considered to be in condition for allowance, and an early reconsideration and a Notice of Allowance are earnestly solicited.

This Amendment increases the number of independent claims by 2 from 5 to 7, and increases the total number of claims by 4 from 21 to 25, but does not present any multiple dependency claims. Accordingly, a Response Transmittal and Fee Authorization form authorizing the amount of \$244.00 to be charged to Sidley Austin Brown & Wood LLP's Deposit Account No. 18-1260 is enclosed herewith in duplicate. However, if the Response Transmittal and Fee Authorization form is missing, insufficient, or otherwise inadequate, or if a fee, other than the issue fee, is required during the pendency of this application, please charge such fee to Sidley Austin Brown & Wood LLP's Deposit Account No. 18-1260.

Any fee required by this document other than the issue fee, and not submitted herewith should be charged to Sidley Austin Brown & Wood LLP's Deposit Account No. 18-1260. Any refund should be credited to the same account.

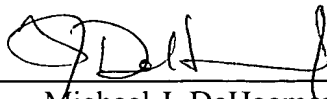
If an extension of time is required to enable this document to be timely filed and there is no separate Petition for Extension of Time filed herewith, this document is to be construed as also constituting a Petition for Extension of Time Under 37 C.F.R. § 1.136(a) for a period of time sufficient to enable this document to be timely filed.

Any other fee required for such Petition for Extension of Time and any other fee required by this document pursuant to 37 C.F.R. §§ 1.16 and 1.17, other than the issue fee,

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Respectfully submitted,

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